IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

REPLY BRIEF FOR THE APPELLANTS

Ex parte KIM et al.

METHOD FOR MANUFACTURING CATALYTIC OXIDE ANODE USING HIGH TEMPERATURE SINTERING

Serial Number: 10/022,357
Filed: December 20, 2001
Appeal No.:
Group Art Unit: 1763
Examiner: R. Culbert

Submitted herewith is a Reply Brief. In the event that there may be any fees due with respect to the filing of this paper, please charge Deposit Account No. 01-2300, **referencing docket number 101190-00022**.

Respectfully submitted,

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Date: February 17, 2005

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In re the Application of:

Kwang-Hook KIM et al. Examiner: R. Culbert

Application No.: 10/022,357 Group Art Unit: 1763

Filed: December 20, 2001 Attorney Dkt. No.: 101190-00022

For: METHOD FOR MANUFACTURING CATALYTIC OXIDE ANODE USING HIGH TEMPERATURE SINTERING

REPLY BRIEF UNDER 37 C.F.R. § 41.41

Date: February 17, 2005

I. INTRODUCTION

The Appellants have received the Examiner's Answer dated December 20, 2004, in the above-referenced appeal. Pursuant to 37 C.F.R. § 41.41 and MPEP § 1208.03, Appellants respectfully submit this Reply Brief.

II. SUMMARY

This paper is submitted as part of an appeal from the rejections set forth in the final Office Action dated April 6, 2004, in the above-referenced application. The issue on appeal is whether claim 2 would have been obvious under 35 U.S.C. § 103(a) over Beer (British Patent No. 1,480,807).

III. ISSUES IN REPLY BRIEF

The claimed subject matter of independent claim 2, the only claim pending in the application, relates to a method for manufacturing a catalytic oxide anode using high

temperature sintering, wherein a TiO_2-screening layer, which is a metal oxide layer of TiO_2, SnO_2, RuO_2, or IrO_2, sintered at 450 to 550°C, is added between titanium support and a surface of the oxide anode, coated with a precursor solution of $RuCl_3$ or $IrCl_3$ in hydrochloric acid according to a brushing or dipping method, dried at 60°C for 10 min, thermally treated at 250 to 350°C for 10 min, and finally sintered at 600 to 700°C for 1 to 2 hours, said TiO_2-screening layer serving as an valve metal oxide for preventing the activity of the anode from being lowered owing to the oxidation of a titanium base metal caused upon sintering of the anode at high temperature and the solid diffusion of an oxide into the anode surface, said valve metal oxide being selected from the group consisting of TiO_2, SnO_2, RuO_2, and IrO_2 sintered at 450 to 550°C.

The present specification explains that "[a]ccording to the present invention, a decomposition efficiency of organic substances by the oxide anode is increased by 50 to 100% because the oxide anode is manufactured at 600 to 700°C, which is higher than a conventional sintering temperature range for manufacturing RuO_2 or IrO_2 anode ... thereby the performance of the catalytic oxide anode is improved" (page 11, lines 7-14, of the present specification).

In the Office Action dated April 6, 2004, claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Beer (British Patent Specification No. 1,480,807).

The April 6, 2004, Office Action indicated that a sintering temperature range and a layer material are the same as those of Beer, and a TiO_2-screening layer is formed between a ruthenium oxide formed while being in contact with a titanium surface and a platinum metal oxide, and thus, a TiO_2-screening layer according to Beer may be used with the same aim as the subject invention.

However, Appellants respectfully submit that claim 2 of the subject invention would not have been obvious in view of Beer.

As Appellants explained in their Appeal Brief, the subject matter of pending claim 2 requires sintering at two different temperatures, namely both sintering at 450°C to 550°C **and** at 600°C to 700°C. Appellants again submit that Beer, at best, only very broadly mentions a single oxide formation and adherence step at 400°C-650°C.

The Examiner's Answer asserts that "Beer teaches ...both a first step of sintering step (*sic*) at 400° C to 650°C" referring to page 3, lines 89-108 and "a second step of sintering at a temperature of 400°C to 650°C" referring to page 3, lines 125 to page 4, line 2 of Beer.

However, it is clear from Beer that the asserted first and second steps are really only a single step. Beer does **not** make two sintering treatments at 400° C to 650°C. What the Examiner asserts are two steps at 400° C to 650°C are really the same treatment step. In particular, Beer states that his invention is directed to a core "coated with at least one electro-conductive oxide, the method comprising applying to the core material a solution of at least one metal salt or a dispersion of said at least one oxide or its corresponding hydroxide, followed by...heat treatment being carried out in three steps, namely, A) drying at a temperature ranging from 80°C to 120°C; B) heating at a temperature ranging from 175°C to 300°C; and C) heating at a temperature ranging from 400°C to 650°C" (see page 1, line 88 to page 2, line 13).

Beer goes on to state that "[p]referably, a coating of a mixed oxide crystal of an oxide of a metal of the platinum group and an oxide of a film forming metal is formed and adhered to the core" (page 2, lines 14-17). Thus, in Beer's preferred embodiment,

a mixed oxide crystal of a metal of the platinum group ("osmium oxide, rhodium oxide, platinum oxide, palladium oxide, iridium oxide and ruthenium oxide"-page 1, lines 22-24) and a film forming metal ("titanium, tantalum, zirconium, niobium"-page 3, lines 93-95) is adhered to the core.

In Example 6, Beer discloses that a "plate of titanium...was provided with a porous layer of one or more oxides of film forming metals...[where] the plate may be suspended in a solution of salts..." (page 3, lines 89-99). Beer further states that "[c]rystallization promoting agents...may be added to these solutions, as a result of which the desired crystal form of the deposited oxides...may be obtained at lower temperatures... It may be desirable for the metal, on to which the porous coating of oxide(s) is to be formed, to be preoxidized anodically or thermally in order to provide better adherence to the oxides to be applied...A plate thus provided with a porous coating in a thickness of 0.01 to 10 mm is then coated with ruthenium oxides of one or more of the other platinum metals in accordance with the present invention" (page 3, line 125 to page 4, line 2).

Thus, Beer teaches that, before the three step heat treatment, the crystallization promoting agents may be added to the solution, the plate may be preoxidized and the porous coating can be coated with ruthenium oxides.

Example 6 of Beer appears to correspond with Beer's preferred embodiment, that is "a coating of a mixed oxide crystal of an oxide of a metal of the platinum group and an oxide of a film forming metal is formed and adhered to the core" (page 2, lines 14-17).

Nowhere does Beer teach or suggest that a step of sintering at 400° C to 650°C occurs prior to adding crystallizing agents, pre-oxidizing the metal, and coating with

ruthenium oxide. As such Beer nowhere teaches or suggests **both** sintering at 450°C to 550°C **and** at 600°C to 700°C, as required by the present claims.

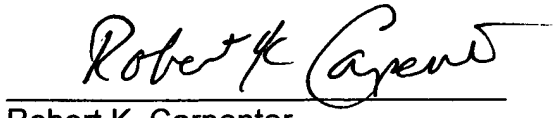
Conclusion

For all of the above-noted reasons, it is strongly contended that clear differences exist between the present invention as recited in claim 2 and the Beer reference relied upon by the Examiner.

This final rejection being in error, therefore it is respectfully requested that this Honorable Board of Patent Appeals and Interferences reverse the Examiner's decision in this case and indicate the allowability of claim 2.

In the event that this paper is not considered timely filed, Appellants respectfully petition for an appropriate extension of time. Any fees for such extension, together with any additional fees which may be due with respect to this paper, may be charged to Deposit Account No. 01-2300, making reference to attorney docket number 101190-00022.

Respectfully submitted,



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